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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/633,916	08/04/2003	Thomas McCabe	BW-DKT03054	7565

32175	7590	09/09/2005	EXAMINER	
BORGWARNER INC. 3850 HAMLIN ROAD AUBURN HILLS, MI 48326			ESHETE, ZELALEM	

ART UNIT	PAPER NUMBER
3748	

DATE MAILED: 09/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/633,916		MCCABE, THOMAS	
	<b>Examiner</b>		<b>Art Unit</b>	
	Zelalem Eshete		3748	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 August 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 August 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

This Office Action is in response to the amendment filed on 8/10/2005.

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1,2,5-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Kolias et al. (5,245,968).

Regarding claim 1: Kolias discloses a VCT system having a phaser for adjusting an angular relationship between a crank angle of the crank shaft and a cam angle of a cam shaft (see abstract), the system further has a controller adapted to determine the angular relationship based on equally spaced teeth distributed upon the circumference of at least one tooth wheel coupled to either the crank shaft or the cam shaft (see figure 1), a method comprising the steps of: a) providing a tooth wheel having a physically non-symmetrical tooth distribution on the circumference of the wheel (see numerals 74,76,82,78,80); and b) adjusting the physically non-symmetrical tooth distribution into a symmetrical tooth distribution for further processing by the controller (see numeral 74,76,78,80; see column 4, lines 25 to 55).

Regarding claim 2: Kolas discloses the claimed invention as recited above; and further discloses the system further has a controller adapted to determine the angular relationship based on a known relationship of equally spaced teeth distributed upon the circumference of the crank shaft (including the imaginary teeth (missing teeth) "detected" by the controller) (see figure 1, column 3, lines 55 to 61) and the cam shaft respectively (see figure 1, numeral 62 and 72), a method comprising the steps of: providing a crank tooth wheel having known tooth distribution (see numeral 50); providing a cam tooth wheel having known tooth distribution (see numerals 62,72); and adjusting the controller for adjusting values known to the controller as needed (see figure 1) wherein at least one the wheels has a non-symmetric tooth distribution (see figure 2).

Regarding claim 5: Kolas discloses the crank tooth wheel having known tooth distribution comprises symmetric tooth distribution (including the imaginary teeth (missing teeth) "detected" by the controller) (see column 3, lines 55 to 61).

Regarding claim 6: Kolas discloses the crank tooth wheel having known tooth distribution comprises non-symmetric tooth distribution (see figure 1).

Regarding claim 7: Kolas discloses the cam tooth wheel having known tooth distribution comprises symmetric tooth distribution (see numeral 62; numeral 74,76,78,80).

Regarding claim 8: Kolias discloses the cam tooth wheel having known tooth distribution comprises non-symmetric tooth distribution (see numeral 72,74,76,82,78,80).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3,4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kolias in view of Takahashi (6,880,504).

Regarding claim 3: Kolias discloses the claimed invention as recited above; however, fails to disclose running a cam pulse interrupt subroutine for determining a first set of adjusted values.

However, Takahashi teaches running a cam pulse interrupt subroutine for determining a first set of adjusted values (see column 10, lines 1 to 5).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Kolias by providing a cam pulse interrupt subroutine as taught by Takahashi in order to implement the valve timing control strategy as taught by Takahashi.

Regarding claim 4: Kolas discloses the claimed invention as recited above; however, fails to disclose running a crank pulse interrupt subroutine for determining a second set of adjusted values.

However, Takahashi teaches running a crank pulse interrupt subroutine for determining a second set of adjusted values (see column 9, lines 54 to 59).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Kolas by providing a crank pulse interrupt subroutine as taught by Takahashi in order to implement the valve timing control strategy as taught by Takahashi.

### ***Response to Arguments***

5. Applicant's arguments filed 8/10/2005 have been fully considered but they are not persuasive.

6. With respect to applicant's argument on pages 7,8: Claims in a pending application are given their broadest reasonable interpretation See *In re Pearson*, 181 USPQ 641 (CCPA 1974). Kolas discloses non-symmetrical tooth distribution as shown in figure 2. In the figure, there are a total of five teeth (see numerals 78,82,76,74,80) that are physically non-symmetrical, in that the tooth distribution is not that of 72 degrees apart ( $360/5$ ). Kolas further discloses the controller further adjust the physically non-symmetrical tooth distribution into a symmetrical tooth distribution for further processing, in that the controller discriminates the four signals (see numerals

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80,78,76,74) thereby resulting a symmetrical tooth distribution for the tooth distribution is 90 degrees a part (see column 4, lines 25 to 55).

### ***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

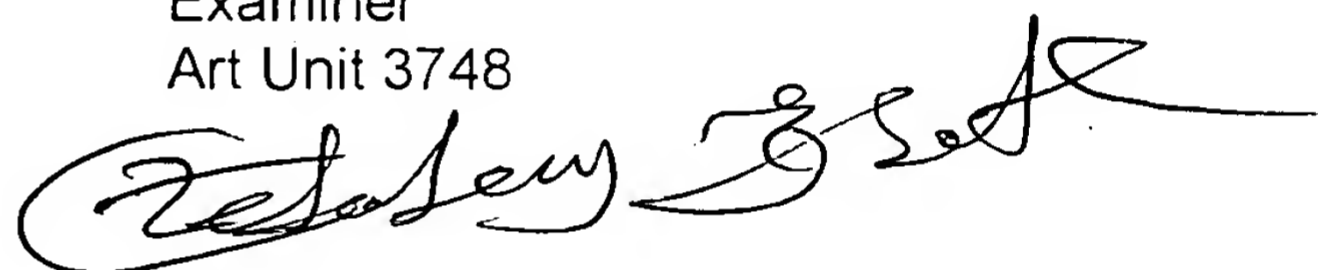
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zelalem Eshete whose telephone number is (571) 272-4860. The examiner can normally be reached on Monday to Thursday.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Zelalem Eshete  
Examiner  
Art Unit 3748



  
**THOMAS DENION**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 3700**